

AVIATION AND AIRCRAFT JOURNAL

NOVEMBER 28, 1921

VOL. XI. NO. 22

Member of the Audit Bureau of Circulations

INDEX TO CONTENTS

Editorials	621	"Who's Who in American Aeronautics"	629
Aeromarine Airways Show Safe Operation	622	The DH-29 Commercial Monoplane	631
N.A.C.A. Recording Air Speed Meter	623	Aero Club of Massachusetts	632
General Patrick Makes Long Airship Trip	624	High Intensity Beacon on Staten Island	632
The Dayton-Wright Model FP-2 Seaplane	625	Organization of Naval Bureau of Aeronautics	633
Civil Aeronautics Bill	626	Fokker Performance on European Air Lines	634
Drag of Zeppelin Airships	626	New Speed Records	634
Legal Aspect of Federal Air Legislation	627	Helium for Airships	635
Annual Meeting, Aero Club of America	628	Foreign Aeronautical News	636

THE GARDNER, MOFFAT COMPANY, Inc., *Publishers*
HIGHLAND, N. Y.

225 FOURTH AVENUE, NEW YORK

SUBSCRIPTION PRICE: FOUR DOLLARS PER YEAR. SINGLE COPIES FIFTEEN CENTS. CANADA, FIVE DOLLARS FOREIGN, SIX DOLLARS A YEAR. COPYRIGHT 1921, BY THE GARDNER, MOFFAT COMPANY, INC.

ISSUED EVERY MONDAY. FORMS CLOSE TEN DAYS PREVIOUSLY. ENTERED AS SECOND-CLASS MATTER NOV. 22, 1920, AT THE POST OFFICE AT HIGHLAND, N. Y., UNDER ACT OF MARCH 3, 1879.

THOMAS-MORSE AIRCRAFT CORPORATION



*Thomas-Morse Training 2-Seater
in flight over Ithaca, N. Y.*

THOMAS-MORSE AIRCRAFT CORPORATION



On Its Metal

"BUILT LIKE A YACHT" was a common saying to express highest praise for fine workmanship. All men know that the ship builder was called upon to make joints better than the carpenter, finish wood finer than the cabinet maker, and forge metal with more skill than the blacksmith.

Airplanes call for all this and more. The Glenn L. Martin Company have found it necessary to separate special departments, construct special tools and train picked men in order to secure the perfection of work which has to go into The Glenn L. Martin Bomber. The photograph shows trained mechanics assemble and complete the smaller metal parts. The inspection department relies on courage of men—each part, no matter how small, must comply exactly with the engineering drawing, and each must fit with absolute accuracy in its respective place.

It is the faithful application of these methods which makes The Glenn L. Martin Bomber the acknowledged superior war plane of America.

THE GLENN L. MARTIN CO.
CLEVELAND

Member of the Manufacturers Aircraft Association



PAUL H. HARRIS



PAUL H. HARRIS

L. D. GARDNER
PRESIDENT
W. D. HOFFA
VICE-PRESIDENT
W. T. BLISSMAN
TREASURER
GEORGE NEWBOLD
BUSINESS MANAGER

**AVIATION
AND
AIRCRAFT JOURNAL**

LABELL O'DAY
EDITOR
ALFRED R. KLEIN
ASSOCIATE EDITOR
EDWARD P. WATSON
FRED H. UYER
CORRESPONDING EDITOR

Vol. XI

NOVEMBER 25, 1937

No. 22

Safe Aerial Transportation

THE last annual report of operations issued by American Airways, Inc., which is reproduced in this issue deserves more than passing attention from those concerned with the development of commercial aviation. Here is a document which affords irrefutable proof that air transport can be made as safe, if not more so, than the older means of transportation.

If it is considered that the operations covered by this report include a great number of flights which were undertaken over stretches of country where ground transportation was totally lacking, the showing made by the American flying boats will only be better appreciated. While it is undoubtedly true that airplanes require much less in the nature of ground organization than land machines, even any body of water constitutes a landing place for emergencies, it seems necessary to point out that flying boats require supply depots and weather forecasting to go on or even to land going airplanes. Hence, when the Santa Maria crossed one-half of the United States by way of the Atlantic Coast, the Hudson, the Great Lakes and the Mississippi, that flying boat accomplished pioneering work of no mean value. That this 7000-mile flight was effected without any noteworthy incident on route, and without requiring shelter for the machine, is a high testimonial both to the airworthiness and seaworthiness of this type, and to the professional skill and devotion of the operating personnel, in the air as well as on the ground.

It is demonstrative of the time which will witness the outpouring of public of the safety, the reliability and the comfort of civil air transport, notwithstanding the aerial accidents whose statistics tend to demonstrate the contrary.

Federal Air Legislation

WE have on other pointed out in these columns the evils of unregulated civil flying that a repetition of this theme might appear superfluous to the reader. Yet, as months pass by without any government agency stepping in to put a check to the unbridled activities of "wing walkers" and the like, it seems necessary once more to call the attention of Congress to the rapid need which exists for a federal regulation of air navigation.

The introduction in the House, by Representative Smith, of the Watersworth Bill, gives renewed impetus to this question. Our readers are aware of the fact that this bill provides for a Bureau of Civil Aeronautics which would have power to regulate air navigation in all parts of the United States. The question has been raised in this connection whether the enactment of federal air legislation would not constitute an infringement of the sovereignty of the states which form the Union. It is obvious that if such were the case the passage of federal air legislation would require a constitutional amendment.

The lengthy procedure which such a measure necessitates would, of course, greatly retard the advent of federal air legislation, with the added threat that several States might indefinitely block the passage of the measure constitutional amendment. The address made by Major Davis before the American Bar Association at its meeting in Cleveland comes in time to dispel these fears. Major Davis points out that the theory of federal air legislation being antagonistic upon a constitutional amendment "is founded solely upon the premise that the air is owned absolutely by the several states and that all flight over such air space constitutes trespass." He continues saying that a careful examination of the authorities will show that this is not law, but merely a theory which has come down to us from medieval days, and that the codes of all countries treat the land owner's right in the air space above his land as subject to a right of passage by aircraft.

Major Davis rightly states that the subject of air navigation is national in its character to such an extent as to require uniformity of regulation affecting all states alike. He also urges that the United States ratify the International Air Navigation Convention, which our representatives signed with certain reservations covering possible constitutional limitations, and that federal air legislation be based on the provisions of this convention.

These views we have already defended on the ground that the ever growing speed and range of aircraft will make it increasingly necessary to have not only one set of aerial law applicable to every nation, or each continent, but to the whole world, as well. The International Convention, unopposed though it may be, affords one instrument of world-wide aerial regulation, and its application by France and Great Britain, to mention but the principal signatories, has proven a great boon to commercial aviation in those countries. Similar action by the United States may be expected to furnish like results.

Fire Fighting Airplanes

HENRY FORDE's newspaper, the *Birmingham Independent*, seems to hold the opinion that aerial bombs can not only seek headlines but revolutionize fire fighting. It has taken seriously the experiments of Russian aviators who claim that they can drop bombs which when they explode will fill the air with gas which will put out the fire in burning buildings.

It is rarely that anything in aeronautics, no matter how extraordinary, is not discussed with credulity by some publication. But until such bombs which can be easily thrown into buildings by other means are successful in stopping conflagrations, it would appear too early to consider the dropping of such extraordinary gases from altitudes that even fire fighting airplanes should be required to fly over cities.

Aeromarine Airways Show Safe Operation

The first report of commercial aviation operations ever made in the United States has been released by the Bureau of Aeronautics, Navy Department. The report covers the operations of the Aeromarine Navy Flying boats in the commercial transportation of passengers, mail and freight for the period commencing Oct. 27, 1920 and ending Oct. 27, 1921.

A Remarkable Record of Safety

During this period of twelve months fifteen Aeromarine flying boats were operated by the Aeromarine West Indies Airways, Inc., which incorporated on May 1, 1920, a daily passenger and mail service between Key West, Fla., and Havana, Cuba, and by its successor, the Aeromarine Airways,

delays were less than those suffered by refueling in eight newscasters.

The flying boat Navy was taken from commission one night in Havana harbor during a terrible gale, blown against some piers and damaged beyond repair. No one was aboard at the time.

The service maintained includes Key West-Havana; Florida-Bahama Islands, New York, Atlantic City and New England ports, New York Night Service, New York-Albany; Great Lakes Region, Mississippi River Valley.

One Flying Boat in 700-Mile Flight

The eleven-passenger Navy F-3L flying boat operated in



AEROMARINE MODEL 90 FLYING BOAT, AN ENCLOSED THREE-ENGINE, NOW FLYING WITH THE NEW AEROMARINE 300 HP. TYPE U ENGINE

which considerably developed aerial night-vision service and did a large amount of pioneering work by making its flying boats so long trips across the country whenever bodies of water are available.

The records show that the fifteen flying boats which the two companies operated covered in twelve months a total distance of 99,620 miles, and carried 3,514 passengers and 23,862 lb. of mail and freight without a single accident. This truly remarkable showing, which compares very favorably with the performance of European air lines, is an excellent demonstration of the safety afforded by flying boats owing to the fact that every body of water is an emergency landing field.

Following are some interesting details regarding the performance of the Aeromarine "White Fleet."

Six eleven-passenger flying cranes of F-3L type in operation carried 1654 passengers 42,690 miles in the air and transported 19,000 lb. of mail and 8906 lb. of freight and baggage, equivalent of seven tons.

Six Navy Coast Patrol five-passenger flying boats of H-3L type carried 4702 passengers 34,920 miles in the air, equivalent of seven tons.

Three Aeromarine Model 90 three-place flying boats earned 1958 passengers 13,109 miles, equivalent of seven tons.

Not a single passenger or employee was injured during these operations. The schedule was maintained throughout with the exception of some delays during adverse weather conditions which caused only slight delays. These

Key West-Havana service during the winter months, after which time of them were laid up for the summer. The remaining boat, Santa Maria, then undertakes a flight from Key West up the Atlantic coast to New York, up the Boston River, over Lake George and Champlain to Montreal, along the Great Lakes to Chicago, and thence by way of Miami and Mississippi across to New Orleans, thence along the Gulf to Key West, a total distance of seven thousand miles.

Of the six H-3L flying boats, four were in constant operation and two were in reserve. One of these boats made a complete circumnavigation of the Great Lakes flying 7000 miles and carrying five passengers; another covered the New England States.

From Palm Beach to Nassau

For operations during the coming year one of the Aeromarine Navy eleven-passenger flying cranes will be placed in operation on the Key West-Havana route and between Palm Beach and Miami and Boston and Nassau, two other flying cranes of the same type will be held in reserve for special chartered parties. Three flying boats are the South Marine, Florida, Cumberland, Palm Beach, Boston and Nassau.

For the other service seven of the five-passenger H-3L type will be placed in active operation and ten others will be held in reserve for special charters. Following are the names of these flying boats: Pennsylvania, New York, South Florida, Virginia, New Jersey.

Those of the Aeromarine three-place flying boats will be used for special services and special charters, with two of these same types held in reserve. It is expected that several new routes will be opened during

the coming year on the Great Lakes and the Aeromarine command and suspension will be extended accordingly.

The Aeromarine will also abridge company twenty-eight flying boats by the end of the year.

N.A.C.A. Recording Air Speed Meter

By F. H. Norton

Langley Memorial Aeronautical Laboratory

Air speed in flight has been recorded in France and in this country almost exclusively by the Toussaint-Leprie air speed meter which consists of a recording pen operated by a spring loaded bellows. For very accurate work this instrument has a considerable amount of friction and external resistance, so in or less that it was not to be used to record rapid changes in air speed, such as happens in flight or pulsations in the wind tunnel. The British have constructed a recording meter which is in construction with the above, it is an aneroid meter, which is of a higher frequency and with less friction than the Toussaint-Leprie instrument.

The N.A.C.A. air speed meter was designed with the idea of producing an instrument for recording the absolute air speed in flight with great accuracy and, at the same time, to have such a high natural frequency that it could be used to study the structure of rapidly changing air flow.

Diaphragm Capable

The pressure difference to be measured is transmitted to either side of a steel diaphragm which is rigidly clamped at the edges between the halves of a circular capsule. As an unstrained diaphragm—due to a time of maturity which can not be removed—has two points of equilibrium at zero pressure, it was found necessary to warp the diaphragm before clamping in order that it might be actually under a slight tension. It is also essential that the material of the capsule and the diaphragm have the same coefficient of expansion, otherwise the sensitivity will change with the temperature.

A hardened steel screw passes through the center of the diaphragm and ends against the polished back of the mirror shaft. This shaft is connected to a highly polished conical steel rod and is held against the diaphragm screw by a light flat spring. A glass mirror carried on the upper end of the shaft is used to reflect the light on the scale. The deflections of the diaphragm are thus converted into a rotary motion of the mirror with very slight friction. The natural frequency of the diaphragm and mirror is over 1000 cycles per second. The diaphragm—2000 cc. chamber plus air space. This frequency could be made even higher than this if it were desired to use the instrument for studying high speed wind waves.

Optical System

The lamp consists of a special 1/8 volt bulb made especially for the work by the Langley staff. To get a very low line source. The light from this lamp passes through a lens in the mirror from which it is reflected back through the same lens to the film, as described more in detail in N.A.C.A. Technical Note No. 22. This side instrument, the lens was a simple one but better results would be obtained by using a corrected photographic objective.

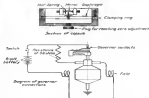
The Film Drive

The film is contained in an airtight light-tight housing. The film is made in the Langley staff. The film is made in the Langley staff.

The Drawing Motor

The film is moved by an electric motor connected to the drum by a worm drive. This motor was developed, after a considerable amount of experimental work, as the most suitable for the purpose of driving a drum at a relatively high speed. This motor is of the direct current, series type and is held at

constant speed by means of a governor as shown in the accompanying diagram. This governor will hold the speed to within ± 2 per cent of constant for considerable changes in voltage and load. The motor runs at 80 rpm, normally taking 1.5 amperes and will reach its normal speed in less than one-half



More details of the N.A.C.A. Recording Air Speed Meter

record after closing the switch, with a starting current of 414 amperes.

Precision of the Instrument

The width of the line traced by this instrument is under 0.0002, due to the poor quality of the lens. If readings are taken on one edge of the line the sharpness is sufficient to read within 1/1000, which will give a precision of 1 per cent when the deflection is only 1/10 in.

In order to determine the systematic of this instrument its readings were compared with those of a water column when the pressure was increased and decreased. The difference between ascending and descending curves was nowhere greater than 2 per cent of the maximum reading, and this would undoubtedly be due to the fact that the conditions of vibration which create on the syphon. For the sake of comparison a similar run was made on a Toussaint-Leprie air speed meter with the pen setting on the paper as a normal manner. In this case the corresponding hysteresis error was 54 per cent of its maximum reading.

Use for the Type of Instrument

This instrument has been used successfully for recording the air speed in flight and for studying the flow in the wind tunnel, but by putting in other thicknesses of diaphragm it will be possible to use it for measuring a large number of aerodynamic and automotive problems. For example it could be used to study the pulsations of flow in an intake or exhaust manifold or the character of the wind emitted by various types of nozzles or the flow over a revolving propeller. For the latter use this instrument has the advantage over a number of laboratory instruments designed for recording wind waves, in that it is portable and can be used under conditions of considerable vibration without having its readings affected.

General Patrick Makes Long Airship Flight

Major Gen. Mason M. Patrick, Chief of Air Service, accompanied by several other Air Service officers, experienced an interesting trip in the *Dayton C-2* on October 18th from Bolling Field to Langley Field, by way of Aberdeen, Md., under unfavorable weather conditions with dense clouds close to the ground through which it was necessary to pass.

The airship left its base station, Aberdeen, Md., at 5:30 a. m., and, accomplishing much of the trip to Bolling Field before daybreak, the crew consisted of Lieut. Max F. Meyer and R. H. Givens, pilot; Maj. R. M. Jones, observer, two engineers, radio operator and two engine mechanics. At the commencement of the trip the clouds were very low, and land marks could not be distinguished until a point in the vicinity of Baltimore was reached. The compass course followed by the airship was maintained until the approach of the ship directly to Bolling Field without any deviation question. During this stage of the trip a head wind of about 15 miles per hour was encountered. The landing at Bolling Field was made at 7:30 a. m., and General Patrick, Maj. General Meyer, Maj. J. A. Mann and Lieut. Courtney Whitney were taken aboard. Maj. R. M. Jones and one rigging crewman here left the airship.

Flying in Fog

The *C-2* took the air again at 7:50—its scheduled time for leaving—and started on the trip to Langley Field. Head winds amounted at from 15 to 20 m. p. h., which was encountered. The ground was visible during the first portion of the journey and until a point approximately 30 miles north from where the entrance of the Potomac River into the Chesapeake Bay is reached. At that time, when it was thought likely that it would be necessary to land at Langley Field in the fog, which was at that time of 800 ft. The arrival of the possibility of striking hills or other objects, the airship ascended higher and maintained an altitude of from 500 to 1,000 ft. for the remainder of the trip. Dense clouds were rolling along the surface of the ground, and it was not until about an hour and a half of flying through the fog that the ground was visible again, except for a brief interval when the ship crossed the Potomac River. At a point in the vicinity of the Hagerstown River the fog dissipated somewhat, and thereafter the ground was visible. During the flight through the fog the wind changed in a more westerly direction and veered the ship some 5 to 10 miles off its course.

After some difficulty upon arriving from the fog, the exact position of the ship was ascertained, and the remainder of the trip was uneventful, and at about 10:30 a. m. the ship was due to one of the engines cutting out on account of an oil pump, and was vibrating itself loose upon the right motor and thereby becoming when both engines cut out due to the anti-rotationing. These engines stopped the propellers of the propellers took into which the main gasoline tanks of the airship descend. The possibility of carrying out minor repairs upon an airship during flight was demonstrated in two circumstances. In the instance of the Hagerstown River, when the ship was able, after cutting out the motor involved, to crawl out upon the engine girders and thereby reach and tighten the offending, loose, oil pressure line. The fix effected was that running from the oil tank to the pump of the gasoline feed trouble. The engine motor immediately cut out for lack of gasoline supply systems.

There is a small tank of approximately five gallons capacity located in the extreme section of the star below the level of all three gasoline storage tanks. Gasoline flows into this tank supplied with a float check valve, which is filled by gravity from the main tanks. In the star design and close to the propellers upon either side of the star are located two Holman-type gasoline pumps which operate a pump, forcing the gasoline from the small tank above referred to up into another relatively small tank located above the level of the combustion and the propellers between the engines. This is the final line in the record of this simple and effective gasoline supply system, above described, depending on three gasoline pumps permanently installed and provided for just such emergencies were

encountered after it had been ascertained that the trouble lay in the non-functioning of the main tank. In each of the two other instances when the engine cut out, the ship was found to be in almost perfect equilibrium.

At a point approaching the York River planes from Langley Field, consisting of three DH-6s and one heavy bomber, met the airship, forming an escort for the remaining distance to Langley Field. The airship landed at Langley Field at 12:50 p. m.

In the afternoon, at 3:00 p. m., the airship with all passengers returned on the above trip, and in addition with Lieut. George F. Purvis aboard, back off for the return trip to Bolling Field, which was accomplished without incident, the visibility being good. A wind of about 15 miles from the southeast helped to speed up the trip very materially, and the landing at Bolling Field was made at 5:15 p. m., when General Patrick, Major Whitney, Major Mary W. Lieutenants Wilson and Lieutenants, and 15 men later the ship took the air once more upon the last leg of the trip to Aberdeen, Md., taking on as passengers Lieutenants Wm. R. Connolly and Earle J. Cunningham. It was dark when the ship reached the District Line, and the remainder of the trip was made in gradually increasing darkness. When passing over Edgewood Arsenal, the airship landed at Aberdeen Proving Grounds, and proceeded with lights, was seen. Landing at Aberdeen was made at 6:00 p. m., without incident.

Trip a Great Success

As a whole the trip was a pronounced success, and all components of the ship had ample opportunity to judge the characteristics of flight in a weak airship under dense foggy conditions. At one time, when it was thought likely that it would be necessary to land at Langley Field in the fog, which was then rolling directly upon the ground and of sufficient density to preclude the possibility of seeing the ground from a greater altitude than 500 ft. a plan was suggested that was obtained from Langley Field to the effect that a ceiling of 900 ft. obtained at that field. This news proved somewhat of a disappointment to the crew of the airship, as they believed it would have been very profitable to land at Langley Field. The crew of the airship then flew to the house on such a far, made a successful landing. Under such conditions a captive balloon at 3,000 ft. altitude would definitely have located the field, as the upper portion of the fog would not obscure the field. The airship could have been seen at distances in excess of 20 miles. Another very effective method would have been to arrange a searchlight at Langley Field, throwing up a great column of hot smoke, thereby making the airship conditions to within of three and four thousand feet. The Indians used this method during the war on the Austrians from very effectively.

The *C-2* is a successful airship, powered by two 250 hp. Hispano-Suiza engines. Its length is 150 ft., maximum diameter 24 ft., capacity 161,000 cu. ft., and it is capable of attaining a speed of 60 m. p. h.

With the advent of the new airship Army Air Service from Langley Field, the above under previously any similar conditions and its greatly extended range will be perfectly feasible. Comfort, reliability and superbly fast time for the longer distances will be secured. Present and to the Pacific Coast from Langley Field, the home of the Army, are perfectly feasible, and such a run as General Patrick took in the *C-2* from Washington to Langley Field and return will doubtless find the successful and improved construction in a not distant future run from Washington to Los Angeles and return.

While at Langley Field General Patrick and Major Whitney inspected the airship *Bum*, which was found to be about 25 per cent overrated and fast approaching obsolescence. General Patrick, however, expressed great interest in the new technological conditions prevailing and in the operation of the airship and its ground performance. On alighting at Bolling Field he expressed himself as well pleased with the trip.

The Dayton-Wright Model FP-2 Seaplane



THE DAYTON-WRIGHT FP-2 FERRY PASSENGER AND FREIGHT SEAPLANE

The Dayton-Wright Co. recently completed the construction of its Model FP-2 seaplane, which, as may be seen from the description which follows, embodies some highly interesting features.

This type was developed to satisfy the requirements of forest patrol services for an airplane specially equipped for aerial photography, mapping, surveying, inspection and timber patrol in territory otherwise inaccessible and having no other landing facilities than bodies of water. Such airplanes are particularly effective not only in Canada, and for this reason a pilot of the first speed several months in the Dominion to gather impressions as to the kind of service such a machine would have to perform in every day operations. As a result of his recommendations, special care was given in the design of this machine to long distance, economy, (3) wide angles of vision for the airphoto, (2) comprehensive adaptations for

the crew, (3) provisions insuring the safety of the machine under almost any emergency, and (4) adaptation of the machine to the special conditions under which it would be called to operate.

Construction Features

The type of construction adopted for the Model FP-2 covers the purpose of making maintenance cheap and easy. The upper and lower wing panels are interchangeable, and so are many of the fittings. The wing spars are of box construction, while the ailerons and the main spar are of the same type. The wings are fabric covered. The fuselage is built of four spruce longitudinal and a number of heavier bulkheads, and is covered with a special three-ply consisting of a core of Balsam wood and black walnut faings.



THE DAYTON-WRIGHT FP-2, AS ORIGINALLY FITTED WITH TWO HALL-SCOTT L-6 ENGINES AND FERRIS. ON THE RIGHT A VIEW FORWARDED FROM THE CABIN

THE Aircraft Service Directory

WHERE TO PROCURE EQUIPMENT AND SERVICES

SPERRY
AIRPLANE INSTRUMENTS
USED ALL OVER THE WORLD

THE LAWRENCE SPERRY AIRCRAFT CO., INC.
Farmingdale, Long Island, New York

Phone: Farmingdale 133

CANUCK and OX5 SUPPLIES

COMPLETE ASSORTMENT AT LOWEST PRICES

Recover your Canuck during winter months

- 1 Set (4) wing covers (cotton) with tape and dope \$69.00
- 2 Upper wing covers (cotton) with tape and dope \$45.00
- 2 Lower wing covers (cotton or linen) with tape and dope \$38.00

Single covers Upper \$15.00, Lower \$14.00

Acetate dope per gal. \$1.00

Other material & parts at correspondingly low prices

Aircraft Materials & Equipment Corp., 1409 Sedgwick Ave., N. Y. C.



**WRITE FOR OUR
SPECIAL PRICE LIST
CANUCK, JN., AVRO
AND OX-5 PARTS**

ERICSON AIRCRAFT LIMITED

120 KING ST., EAST, TORONTO, CANADA

OTTO PRAEGER

Commercial Aeronautics

5052 Grand Central Terminal Building

New York City

AIRPLANE ENGINES LOWEST PRICES

IMMEDIATE DELIVERY

We Specialize on Isotta-Fraschini & Hispano-Suiza

AERO DISTRIBUTING COMPANY

17 East 42nd St., Room 419

New York City

EYTINGE'S FLYING GUIDE

BY BRUCE EYTINGE

Contents—Calendar—Identification—40 Photographs of Landing Fields—Don'ts—Helpful Hints—Landing field report form and specifications for municipal fields—Certificates for pilots and medical qualifications—Trouble shooting in Airplane Engines—Air routes—America's aviation facilities under each state—1500 Fields 1921 edition, enlarged and revised to date.

PRICE \$2.50

BRUCE EYTINGE, 4554 Park Ave., New York City.

IMPORTED COMMERCIAL AERIAL CAMERAS

Latest model brand new 2 1/2" x 3 1/2" GAUMONT CAMERA
200' 1/8.3. Krauss Lens, 12 plate automatic magazine, suitable
for mapping and obliques \$500.00
Extra 12 plate automatic magazines 40.00
2 1/2" x 3 1/2" GERMAN ICA CAMERA, 120' 1/4.5. Voigtlander
Helios Lens including four all aluminum plate magazines 400.00

FAIRCHILD AERIAL CAMERA CORPORATION
136 WEST 53 STREET NEW YORK CITY

ACETATE AEROPLANE DOPE

Eastman, Clear Acetate Dope, Code No. 47, in 50 gal.; steel drums;
at less than ONE HALF MANUFACTURERS PRICE. This
dope is approved by the Engineering Division, Air Service, McCook
Field, for use on Gov't. Contracts, and all purchasers of this Dope
will be notified by the above Department of this approval.

BRAMER-KELLY-CANFIELD CO.,

134-16th St., BUFFALO, N. Y.

CURTISS SHIPS FOR SALE

\$500.00 AND UP

CURTISS EASTERN AIRPLANE CORP.

130 S. 15th St.

Phila., Pa.

SUPPLIES — "CANUCK" "JN" "OX5"

IMMEDIATE SERVICE

Our large stock is positively the most complete in the States.
When you order it from us you get it. No time lost from partial
shipment. All materials guaranteed new and unused. Write
for special season price list.

AMERICAN AIRCRAFT, INC.

AERODROME BALTIMORE, MD. STORES
LOGAN FIELD, MD. STATION F. BOX 104 DUNDALK, MD.



Government inspectors found fewer
leaks in G & O airplane radiators
than in any other type tested during
the war.

**THE G & O
MANUFACTURING CO.**
NEW HAVEN CONN.

AIRCRAFT YEAR BOOK 1921

\$3.20 postpaid in U. S. and Canada

GARDNER, MOFFAT CO. INC.

225 Fourth Ave.

New York

AN OPPORTUNITY TO COMPLETE YOUR FILES

We have a limited supply of bound and un-
bound volumes, also a few back issues of

AVIATION AND AIRCRAFT JOURNAL

nos. FOURTH AVE. NEW YORK CITY

Price upon request

WRITE for INFORMATION

About this Directory Advertising

IT'S BRINGING RESULTS